



**Biometric Technology Controls Access  
to SFIA's Secured Area**


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**San Francisco International Airport**

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SPECIAL SYSTEMS MANAGEMENT**




## Introduction

- Overview of SFIA
- Commitment to *exceed* Aviation Security regulatory standards
- Historical and systems perspectives
- Strategies for deployment of Access Control System (ACS)




## Introduction (Cont'd)

- SFIA's implementation of Biometric Technology—*Recognition Systems Inc. (RSI)*
- Dynamics of Biometric Access Control—Increased Security/Reduced Vulnerability



## Introduction (Cont'd)


- **Advantages of *Biometric Technology***
- **Systems deployment, operations, administration, and performance**
- **Summary**



## Security Philosophy


- **Ensure high security integrity**
- **Exceed FAA regulatory requirements**
- **Enhance security performance**
- **Improve systems with advanced technologies**
- **Elevate operational effectiveness and efficiency**





## **FAR 107.207 Secured Area**

- **Objective**—greater control around terminal facilities, ramp and aircraft
  - Provide access to authorized individuals
  - Deny unauthorized access
  - Differentiate authorized areas for access



## **Secured Areas**

- **Air Operations Area (AOA)**
- **Terminal Areas**
  - Public Non-Sterile Areas
  - Public Sterile Areas (boarding areas)
  - Restricted Areas (employee offices)
  - Secured Area (aircraft and ramp)



### FAR 107.207 Secured Area



ID Card/Hand Geometry Readers provide access control



### Authorized Access Control @ SFO

- Begins with Identification (ID) Media—Card Reader
- Combines with Biometric Technology—Hand Reader



...Dual systems provide utmost access control



## Access Control System Enrollment

- Application with employer's endorsement
- Valid supporting identification media
- Background investigation
- Fingerprint analysis



## Biometric Choices



**Hand Geometry**




**Fingerprint**





















**Face**




**Iris**




## Biometric Comparisons

Requirements				
Enrollment –Low Failure Rate, Fast				
Low False Reject Rate				
Low False Accept Rate				
Outdoor Performance Maintained				
Fast Throughput				
User Acceptance				
Large Scale Airport Access Experience				


### Hand Geometry Fits






## Historical Perspective

- **Access Control System (ACS)—*Biometric Technology...hand geometry***
  - Used at SFO for the past 13 years
  - Initially...Domestic Terminals
  - New International Terminal Complex
  - Selected AOA perimeter facilities



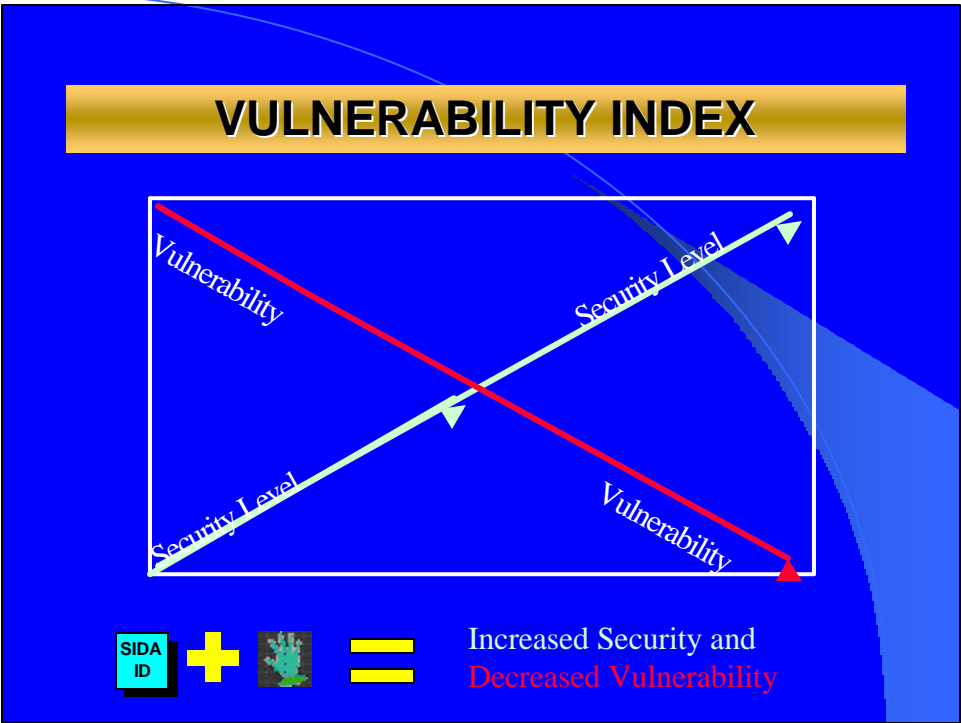
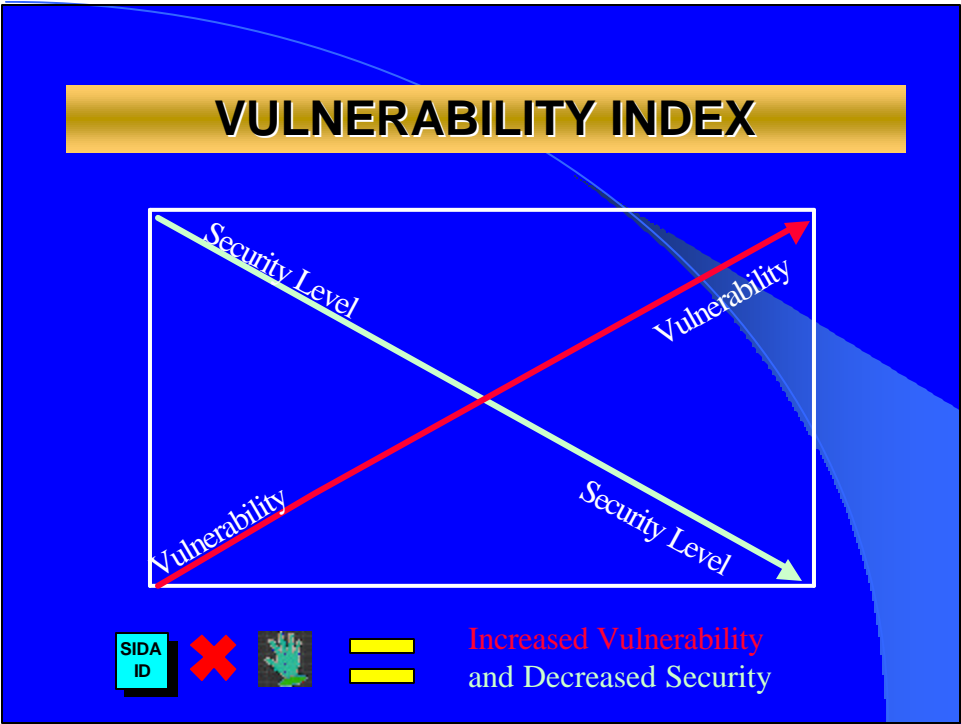
## Systems Perspective

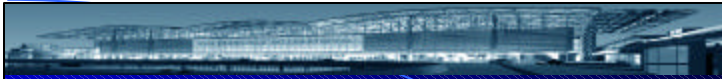
- *ACS—Biometric Technology...hand geometry*
  - Originally installed by Center Pointe Systems, Inc.
  - Started with 386 PC 33 MHz & 100 MB HD file server with DOS
  - Upgraded computer system 5 times
  - Today...two Pentium II PC 300 MHz cross connected file servers with new OS 2



## OVERARCHING MISSION OF BIOMETRICS


- *Limitations of Card Reader System*
  - Card readers **ONLY** identify authorized cards for access...not individuals
- *Advantages of Hand Geometry System*
  - Positively validates individuals with authorized access





## **Personnel Requiring AOA Access**

- **Airport Commission, SFPD & SFFD**
- **Air Carriers and Cargo Operators**
- **Federal Agencies**
- **Concessionaires**
- **Catering Services**
- **Vendors**
- **Contractors**



## **Biometrics Airport-wide**

- **Approximately 1500 access portals**
- **200+ access portals equipped with Card/Biometric Hand Readers (full ACS)**
- **Deployed at all access portals leading directly to the Secured Area**



## Biometrics Performance/Data

- System transactions—over 250,000 per day
- Average processing time—less than 15 seconds
- Reliability—99.99%
- System capability—upgradeable and expandable



## Deployment of RSI System



Access Portal leading  
to AOA





## Access Control Architecture



**Turnstile Vestibule  
with Card/Hand Geometry Reader**




## Systems Database Administration

- **License and Permit Bureau**
  - Performs initial enrollment
- **Aviation Security**
  - Information Systems (IS) Technician programs and maintains database
- **Information Technology and Telecom**
  - Provides oversight, guidance and management




## **System Maintenance**

- ***Airport Electrical Division***
  - MDI/RSI trained personnel
- ***Vendor/Contractor Support***
  - Provide hardware components and technical support
  - Assist SFIA team with installation




## **Organizational Responsibilities**

- ***Aviation Security***
  - Policy and procedures
  - Regulatory compliance
  - Strategic planning
- ***License and Permit Bureau***
  - Enrollment & training
  - ID media issuance

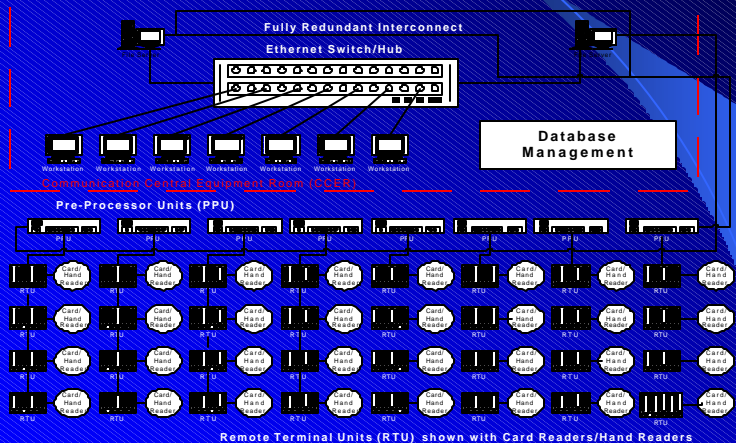


# System Configuration

- File server with PCs
- Telephone and fiber optic lines
- Uninterrupted Power Supply (UPS)
- Card *swipe* and biometric hand readers
- ID access media (badges)

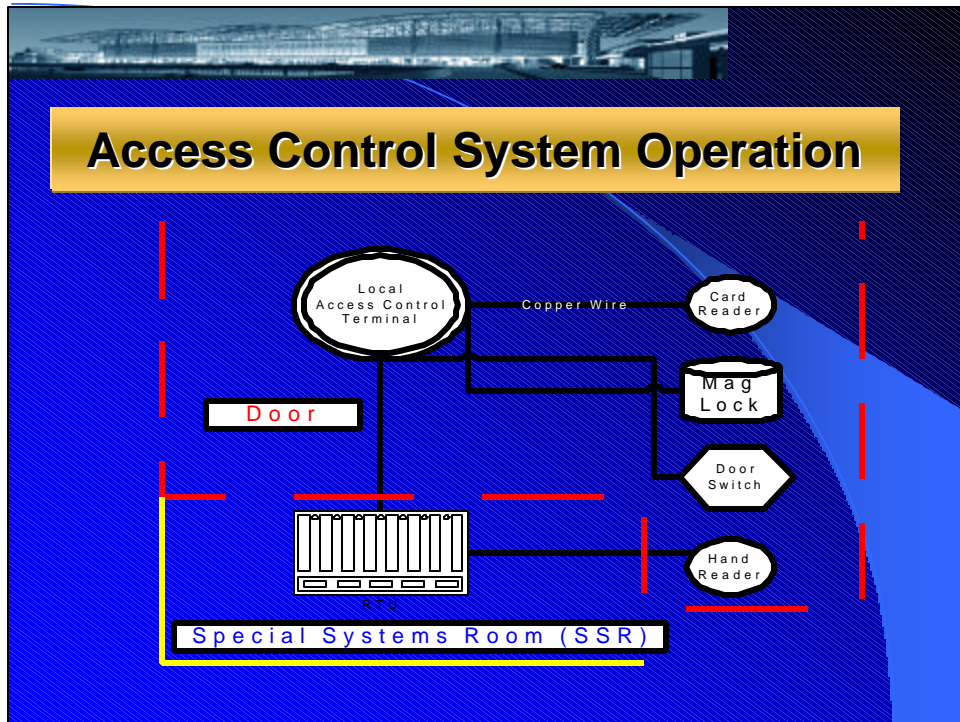


# Access Control System Overview



The diagram illustrates the architecture of the Access Control System. At the top, a 'Fully Redundant Interconnect' connects two server racks. Below this is an 'Ethernet Switch/Hub' which is connected to a row of 'Workstations'. To the right of the workstations is a 'Database Management' box. Below the workstations is a row of 'Pre-Processor Units (PPU)'. Each PPU is connected to a grid of 'Remote Terminal Units (RTU)'. Each RTU is shown with a 'Card Reader' and a 'Hand Reader'.

Remote Terminal Units (RTU) shown with Card Readers/Hand Readers




## Access Control—Applying Error Rates

- A False Reject can occur with EVERY use of the system
- A False Accept can ONLY occur when an unauthorized person makes an attempt

*“There are a lot more Good Guys”*

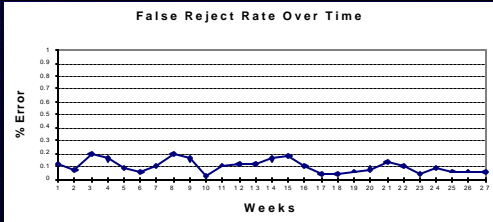
(quote by Bill Spence, RSI)



## Unparalleled Accuracy

### *The Lowest False Reject in the Field*

- Field Demonstrated 0.1% False Reject Rate
  - Demonstrated average 0.1% false reject rate over 6 months
  - Data is from a US Nuclear Power Plant
  - Over 250,000 transactions
  - 2,800 users
  - 0.1% False Accept Rate




False Reject Rate Over Time

% Error

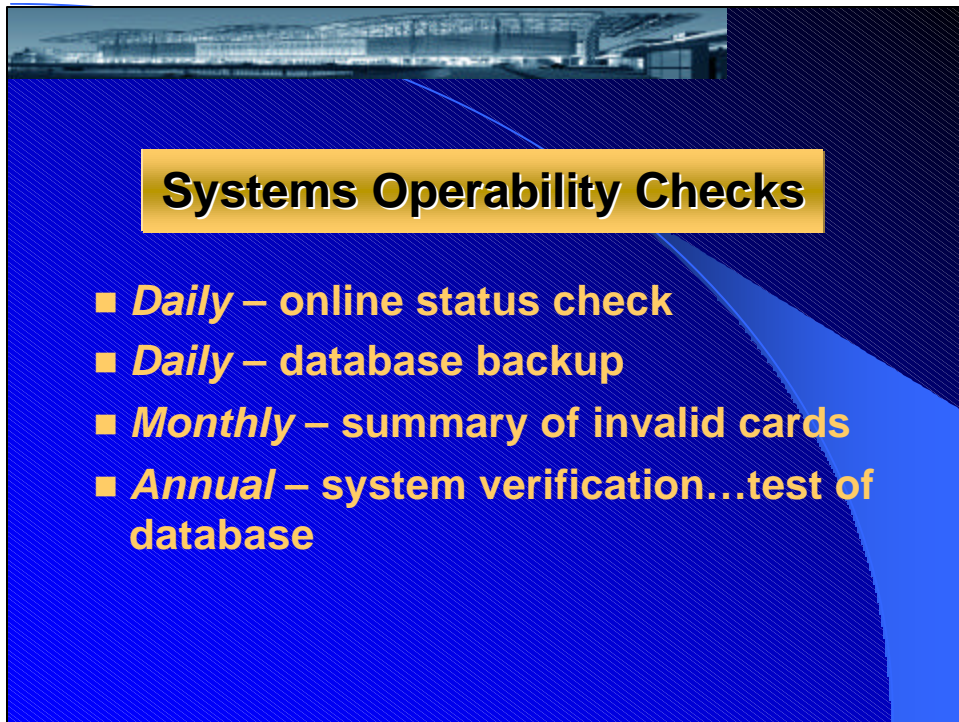
Weeks

**IR** Recognition Systems



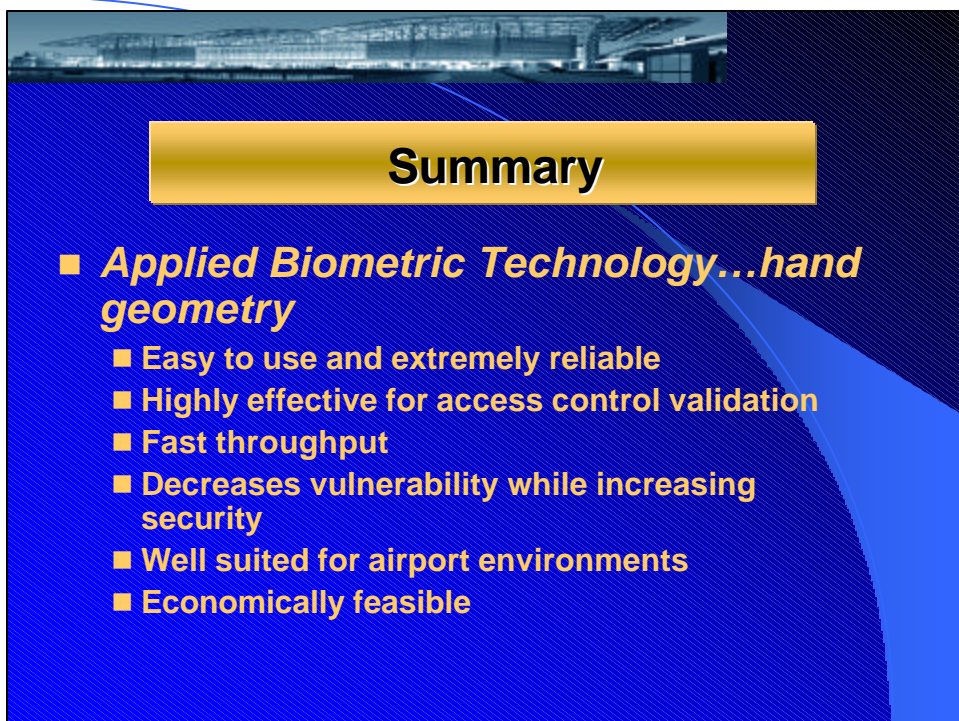
## Unparalleled Speed

- **High throughput**
  - Quick positioning time
  - Verification time 1 second or less
- **A low false reject rate is CRITICAL...**  
Authorized workers must get through the door!
- **System provides lowest false reject rate in difficult environments...0.1%**
  - Real world data backs it up, *daily*



## Systems Operability Checks

- *Daily* – online status check
- *Daily* – database backup
- *Monthly* – summary of invalid cards
- *Annual* – system verification...test of database



## Summary

- *Applied Biometric Technology...hand geometry*
  - Easy to use and extremely reliable
  - Highly effective for access control validation
  - Fast throughput
  - Decreases vulnerability while increasing security
  - Well suited for airport environments
  - Economically feasible

